

**IN THE CLAIMS:**

Please write the claims to read as follows:

- 1 1. (Currently Amended) A method of performing echo suppression in a telecommunica-  
2 tions system, ~~including the steps of the method comprising:~~  
3 (A) calculating ~~the at least one value representing energy represented in each a~~  
4 plurality of pulse code modulated (PCM) sample samples of voice information received  
5 from a user's telephone equipment an input speech signal;  
6 (B) building a synthetic echo envelope from said values;  
7 ~~(B)(C)~~ aggregating the energy data said values for the at least one samples sam-  
8 ple over a 5 msec-period of time to form a frame of an aggregate energy value for that  
9 period of time;  
10 (D) solving ~~the a plurality of normal equations for the matrix~~ said aggregated  
11 values, the plurality of normal equations having a plurality of results;  
12 (C) ~~populating a matrix with these aggregate energy values;~~  
13 ~~(DE)~~ examining the results to determine a peak aggregate result which will in-  
14 dicate, the peak aggregate indicating the a time delay and a gain of the an echo path; and  
15 (F) evaluating each incoming PCM sample against ~~the a~~ a corresponding output  
16 energy result obtained at ~~the a~~ a determined time delay, and if ~~the an~~ an input speech energy is  
17 determined to be less than a historical output energy scaled by a determined gain, then ~~the~~  
18 signal is classified as suppressing echo and is suppressed from the input speech signal.
- 1 2. (Original) The method of performing echo suppression as defined in claim 1 including  
2 the further step of smoothing the results of the normal equations by applying a moving  
3 average to correlations and energies over each frame across the time dimension.

1 3. (Original) The method of performing echo suppression as defined in claim 1 including  
2 the further step of determining said time delay by measuring the time elapsed between the  
3 beginning of measurements and the reaching of the peak aggregate result.

1 4. (Original) The method of performing echo suppression as defined in claim 1 including  
2 the further step of employing a voice activity detector to verify that voice information is  
3 on the line and if so, then performing steps A through F and suppressing any echo that is  
4 determined to exist.

1 5. (Currently Amended) An apparatus for performing echo suppression techniques in a  
2 telecommunications system, the apparatus comprising:

3 (A) a receiver that receives a plurality of pulse code modulated (PCM) sam-  
4 ples of voice information from a user coupled with the system;

5 (B) an energy accumulator coupled to said receiver that calculates ~~the~~ at least  
6 one energy value ~~offor the~~ input speech signals and aggregates ~~the these energies~~ energy  
7 values over a predetermined time period to create a synthetic echo envelope from said  
8 samples;

9 (C) digital signal processing circuitry coupled with said receiver and said en-  
10 ergy accumulator that is programmed adapted to perform the following:

11 (i) ~~populate a matrix with energy aggregate values for 5 msec~~  
12 frames;

13 (ii) ~~solve normal equations for said matrix;~~

14 (i) ~~produce results and evaluate said results~~ energy values to  
15 find a peak aggregate value and a time lag; and

16 (Dii) ~~checking check~~ each incoming speech PCM sample against  
17 said peak aggregate value and time lag to determine  
18 whether said speech samples contain an echo; and

19 (ED) ~~means for suppressing an echo suppressor responsive to said digital signal~~  
20 processing circuitry for suppressing authenticity of the echo that is determined to exist in  
21 an incoming speech sample.

1 6. (Original) The apparatus for performing echo suppression techniques as defined in  
2 claim 5 further comprising  
3 a voice activity detector coupled with said receiver that determines whether in-  
4 coming samples contain speech, and if so, said echo suppression techniques are per-  
5 formed.

Please add the following claims:

1 7. (New) A system for performing echo suppression techniques, the system comprising  
1 (A) a receiver that receives pulse code modulated (PCM) samples of voice in-  
2 formation from a user coupled with the system;  
3 (B) an energy accumulator coupled to said receiver that calculates energy values  
4 of input speech signals and aggregates these energy values over a predetermined time pe-  
5 riod to create a synthetic echo envelope from said samples;  
6 (C) digital signal processing circuitry coupled with said receiver and said energy  
7 accumulator that is adapted to:  
8 (ii) evaluate said energy values to find a peak aggregate value  
9 and a time lag; and  
10 (ii) check each incoming PCM sample against said peak ag-  
11 gregate value and time lag to determine whether said  
12 speech samples contain echo; and  
13 (D) an echo suppressor responsive to digital signal processing for suppressing  
14 echo that is determined to exist in an incoming speech sample.

1 8. (New) The system for performing echo suppression techniques as defined in claim 7  
2 further comprising a voice activity detector coupled with said receiver that determines  
3 whether incoming samples contain speech, and if so, said echo suppression techniques  
4 are performed.